

International Journal of Innovative Research in Science, Engineering and Technology

(A High Impact Factor, Monthly, Peer Reviewed Journal)

Visit: www.ijirset.com

Vol. 8, Issue 3, March 2019

A Simple Acute Myocardial Infarction (Heart Attack) Prediction System Using Clinical Data and Data Mining Techniques

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ABSTRACT: In today's modern world cardiovascular disease is the most lethal one. This disease attacks a person instantly that might create unexpected consequences for the human life. So diagnosing patients correctly on time is the most challenging task for the medical fraternity. The heart disease treatment is quite high and not affordable by most of the patients particularly in India. The research scope is to develop an early prediction treatment using data mining technologies. Now a day every hospital keeps the periodical medical reports of cardiovascular patients through some hospital management system to manage their health-care. The data mining techniques namely decision tree and random forest are used to analyze heart attack dataset where classification of more common symptoms related to heart attack is done using c4.5 decision tree algorithm, alongside, random forest is applied to improve the accuracy of the classification result of heart attack prediction. In this system various data mining technologies are applied to make a proactive approach against failures in early predictions diagnosis of the disease. We proposed an automated system for medical diagnosis that would enhance medical care and reduce cost. Our aim is to provide a ubiquitous service that is both feasible, sustainable and which also make people to assess their risk for heart attack at that point of time or later.

KEYWORDS: Data Mining, Cardiovascular Disease (CVD), Heart Attack, Decision Tree, Random Forest, Smartphone.

I. INTRODUCTION

In today's modern world cardiovascular disease is the most lethal one. This disease attacks a person so instantly that it hardly gets any time to get treated with. So diagnosing patients correctly on timely basis is the most challenging task for the medical fraternity. A wrong diagnosis by the hospital leads to earn a bad name and losing reputation. At the same time treatment of the said disease is quite high and not affordable by most of the patients particularly in India. The motivation of this system is to develop a cost effective treatment using data mining technologies for facilitating data base decision support system. Nowadays, Cardiovascular Disease (Heart Attack) is ubiquitous and one of the major reasons of death worldwide. Early screening of people at risk of having CVD may lead to minimize morbidity and mortality. A simple approach is proposed in this paper to predict risk of developing heart attack using Smartphone and data mining technique.

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II. LITERATURE SURVEY

1] Abhishek Ta, “Heart Disease Prediction System Using Data Mining Techniques”

In this study, the aim was to design a predictive model for heart disease detection using data mining techniques from Tran thoracic Echocardiography Report dataset that is capable of enhancing the reliability of heart disease diagnosis using echocardiography.

2] Sellappan Palaniappan, Rafiah Awang, “Intelligent Heart Disease Prediction System Using Data Mining Techniques”

A prototype heart disease prediction system is developed using three data mining classification modeling techniques. The system extracts hidden knowledge from a historical heart disease database. DMX query language and functions are used to build and access the models. The models are trained and validated against a test dataset. Lift Chart and Classification Matrix methods are used to evaluate the effectiveness of the models. All three models are able to extract patterns in response to the predictable state. The most effective model to predict patients with heart disease appears to be Naive Bayes followed by Neural Network and Decision Trees.

3] Aditya Methaila, Prince Kansal, “Early Heart Disease Prediction Using Data Mining Techniques”

In this paper the focus is on using different algorithms and combinations of several target attributes for effective heart attack prediction using data mining. Decision Tree has outperformed with 99.62% accuracy by using 15 attributes. Also the accuracy of the Decision Tree and Bayesian Classification further improves after applying genetic algorithm to reduce the actual data size to get the optimal subset of attribute sufficient for heart disease prediction. Association classification technique Apriori algorithm, was along with a new algorithm MAFIA was used. Straight Apriori-based algorithms count all of the 2k subsets of each k-item set they discover, and thus do not scale for long item sets. They use “look a heads” to reduce the number of item sets to be counted. MAFIA is an improvement when the item sets in the database are very long.

4] S. Kiruthika Devi, S. Krishnapriya and Dristipona Kalita “Prediction of Heart Disease using Data Mining Techniques”

The accuracy of the algorithms used in each technique can be enhanced by hybridizing or combining algorithms to a single algorithm which may not be accurate for weakly classified sets of data, and is expected to make quicker and more precise decisions.

5] M. Lavanya, Mrs. P. M. Gomathi, “Prediction of Heart Disease using Classification Algorithms”

Medical related information is huge in nature and it can be derived from different birthplaces which are not entirely applicable in feature. The research undertook an experience on application of varies data mining algorithm to predict the heart attacks and to compare the based method of prediction. The predictive accuracy determined by J48, REPTREE, Naive Bayes, neural networks, CART. The overall objective is to study the various data mining techniques available to predict the heart

6] Hlaudi Daniel Masethe, Mosima Anna Masethe, “Prediction of Heart Disease using Classification Algorithms”

The research undertook an experiment on application of various data mining algorithms to predict the heart attacks and to compare the best method of prediction. The research results do not presents a dramatic difference in the prediction when using different classification algorithms in data mining. The experiment can serve as an important tool for physicians to predict risky cases in the practice and advise accordingly. The model from the classification will be able to answer more complex queries in the prediction of heart attack diseases. The predictive accuracy determined by

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J48, REPTREE and SIMPLE CART algorithms suggests that parameters used are reliable indicators to predict the presence of heart diseases.

III. SYSTEM ARCHITECTURE

Data mining is the process of finding previously unknown patterns and trends in databases and using that information to build predictive models.

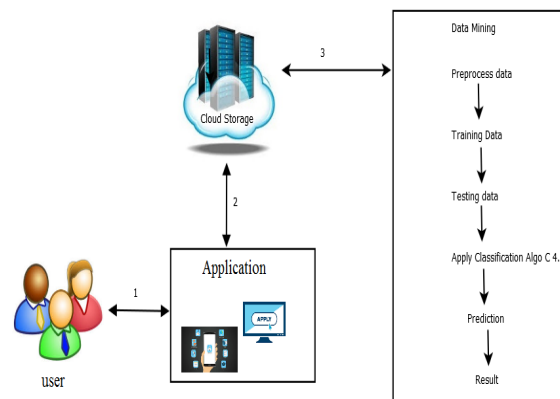


Figure: System Architecture

We have planned to develop an application that will provide interface to both physicians and patients. We have developed a data mining heart attack application that will provide secure, trustful and reliable communication for different communities in healthcare area.

IV. SYSTEM REQUIREMENT

Software Requirements:

- Operating System: Windows 7 or Above
- Programming Language: Java
- Database: MySQL
- Toolkit: JDK 1.8 4
- IDE: Net Beans

Hardware Requirements:

- Processor: Core Intel 3
- RAM: 2 GB or Above
- Hard Disk: 80 GB (min)

V. ADVANTAGES

- The use of this application online social network in day to day life.
- The advantage of this project is to decrease the death ratio.
- Get treatment on time.

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VI. APPLICATIONS

- Hospital

VII. CONCLUSION

The symptoms of heart disease are familiar for everyone. But no one can predict when it may happen and also the prediction will not give any instance status i.e. normal or abnormal. Our research intension is to notify the patients that neither normal nor abnormal at its early stage. The application of data mining algorithms shows it better performance results among themselves. This app will be supposed to predict the heart attack from the chest pain at an early stage and guide the person to take treatment early such as to get their ECG done as early as possible and get evaluated from a doctor to make diagnoses of heart attack.

VIII. FUTURE WORK

In future genetic algorithm will be used in order to reduce the actual data size to get the optimal data subset of attribute sufficient for heart disease prediction. Prediction of the heart disease will be evaluated according to the result produced from it.

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